

include the recitation "wherein the SiO<sub>2</sub> present in the heating element material mixture is a silicate that does not affect molybdenum silicide crystal lattice symmetry." That amendment is based upon the disclosure contained in paragraph [0021] of the substitute specification and it is therefore not new matter. Additionally, none of the references relied upon discloses such a feature, and therefore the combination of the Schrewelius '145, the Schrewelius '959, the Sekhar et al. '399, and the Chyung et al. 091 references does not render obvious the invention as it is claimed in further amended claim 1 as it is presented in the after-final amendment.

With regard to the Chyung et al. '091 reference, at col. 2, line 63 to col. 3, line 1 of the Chyung et al. reference, it states that there be "crystallization promoting agents" and that the "glass-ceramic chosen for use in the cermet must be chemically compatible with the alloy chosen for the metallic phase". Those two statements do not teach one of ordinary skill in the art that SiO<sub>2</sub> that is present in a composition is a "silicate that does not affect molybdenum silicide crystal lattice symmetry" as claimed in amended claim 1. That reference, as well as the other references that are relied upon, does not even mention molybdenum silicide crystal lattice symmetry, and therefore it cannot be construed to teach the additional limitation that is now included in claim 1. The mere mention of crystallization promoting agents says nothing whatsoever about crystal lattice symmetry. Thus, claim 1 as it was amended in the after-final amendment is not obvious based upon any combination of the four references mentioned above. But as was noted in the remarks section of that amendment, there is nothing in those references that would lead one to attempt to combine them, and even if they were construed to do so, it is

not at all apparent from the references precisely which features of which reference should be combined with which features of the other references, and which features are to be ignored in attempting to effect any particular combination.

The Declaration Under 37 CFR 1.132 of coinventor Mats Sundberg that was previously filed herein provides the results of testing that was conducted on molybdenum silicide heating elements that were thermally cycled between room temperature and temperatures of from 1400°C to 1565°C. Compositions including different constituents containing SiO<sub>2</sub> were formed, tested, and evaluated from the standpoint of adhesion to the resulting heating elements of outer layers of Al<sub>2</sub>O<sub>3</sub>. In the examples described in paragraphs 3 and 7 the SiO<sub>2</sub> was provided in the form of bentonite, having 60% SiO<sub>2</sub>, and in the examples described in paragraphs 4, 5, and 6 the SiO<sub>2</sub> was provided as a powder containing at least 98% SiO<sub>2</sub>. In each of the tests in which the tested heating elements were prepared using bentonite as the source of SiO<sub>2</sub> (paragraphs 3 and 7) and thermally cycled, the resulting Al<sub>2</sub>O<sub>3</sub> outer layer flaked and exhibited spalling (paragraph 3), or was fragile and porous (paragraph 7). But in the tests involving heating elements prepared using SiO<sub>2</sub> powder containing 98% SiO<sub>2</sub>, after thermal cycling the resulting heating elements included Al<sub>2</sub>O<sub>3</sub> outer layers that in each case adhered to the heating material surfaces and did not flake off (paragraphs 4, 5, and 6). The results of those tests show that the adhesion to the heating element surfaces of heating elements prepared using 98% pure SiO<sub>2</sub> when subjected to thermal cycling between high temperatures of the order of about 1560°C and room temperature were clearly superior to those prepared using bentonite as the source of SiO<sub>2</sub>.

Finally, in the after-final amendment a copy of the issued European patent (EP 1 492 739 B1) stemming from the same PCT application of which the present application is the U.S. national phase, was attached as evidence that the European examiner concluded that the claims as published as part of that patent satisfied each of the novelty, inventive step (nonobviousness), and commercial applicability criteria set forth in the Patent Cooperation Treaty.

With regard to that corresponding EP patent, filed concurrently herewith is an Information Disclosure Statement that includes a copy of the International Preliminary Examination Report setting forth that examiner's conclusions and including as an attachment the claims that were allowed. As is apparent from that report, the allowed EP claims are broader than those that are now pending in this application. Copies of the references relied upon by the international examiner were identified in the Information Disclosure Statement that accompanied this application upon filing. Additionally, the undersigned's Swedish associate has indicated that in addition to the European Patent, corresponding applications have been granted in Sweden, China, and South Korea.

Early and favorable action on this application is respectfully requested.

Respectfully submitted,



December 12, 2009

Alfred J. Mangels  
Reg. No. 22,605  
4729 Cornell Road  
Cincinnati, Ohio 45241  
Tel.: (513) 469-0470